NSN: NWS0-03-040-0002

ASN: XEHB-6-00-10

DESCRIPTION: **Combined Modification Document - Modification Note 51,** **TCTO 31P1-4-108-591,** **EEM 6345.1 Change 23, Chapter 20,** Expansion of Narrowband Communication Ports in the Radar Product Generation (RPG) Cabinet

DATE OF ISSUE: October 27, 2000

QUANTITY OF ISSUE: EACH

EXPANSION OF NARROWBAND COMMUNICATION PORTS IN THE RADAR PRODUCT GENERATION (RPG) CABINET

DOPPLER METEOROLOGICAL RADAR
WSR-88D

PUBLISHED UNDER AUTHORITY OF THE SECRETARIES OF
COMMERCE, THE AIR FORCE, THE NAVY, AND TRANSPORTATION

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BY ORDER OF THE SECRETARY OF THE AIR FORCE

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TOMA

1.   **SUBJECT**

Expansion of narrowband communication ports in the Radar Product Generation (RPG) cabinet.

2.   **PURPOSE**

To install the necessary hardware on selected WSR-88D RPGs and Principal User Processors (PUP) to support NEXRAD agency requirements for additional port access. The authority for this modification is Radar Operations Center (ROC) Engineering Change Proposal (ECP) F0120, Modem Expansion FY 99.

For additional information concerning this document, contact the ROC Hotline, Norman, OK; phone number: (800) 643-3363 or (405) 366-2980 or by e-mail at NEXRAD.Hotline@noaa.gov. An electronic copy of this document can be found at the following internet address:
www.osf.noaa.gov/ssb/sysdoc/techman/tmlinks.asp

3.   **SITES AFFECTED**

NEXRAD Site Name	Site Name	State	SID	Org Code	Kit A	Kit D
NWS						
Northeast Alabama	Birmingham	AL	BMX	WP9957	E	-
Shreveport	Shreveport	LA	SHV	WP9248	E	-
Melbourne	Melbourne	FL	MLB	WP9204	-	1
Northern Indiana	North Webster	IN	IWX	WR9534	-	E
Louisville	Louisville	KY	LMK	WR9423	E	-
Paducah	Paducah	KY	PAH	WR9957	E	-
DoD						
Vandenberg AFB	Orcutt	CA	VBX	FE4610	1	-
Kunsan AB	Kunsan AB	KO	KUZ	FH5284	E	-
NAS Roosevelt Rds	NAS Roosevelt Rds	PR	NRR	N00389	-	1
FAA						
San Juan	San Juan	PR	JUA	69F362	-	2

E = Use Existing Equipment

4.   **ESTIMATED COMPLETION DATE**

     This modification must be completed and reported no later than 60 days after receipt of this document and kit.

5.   **EQUIPMENT AFFECTED**

     Radar Product Generation Group.
     Principal User Processor Group.

6.   **SPARES AFFECTED**

     Not applicable.

7.   **MODIFICATION ACCOMPLISHED BY**

     Site electronics technicians will accomplish this task. Two technicians are required to perform these procedures.

8.   **MATERIAL REQUIRED**

Nomenclature	Part Number	NSN	Qty
Kit A			
a. Codex 3263 modem	1219739-202	5895-01-377-7105	1
b. DTE cable, DB 25/DB 26 connector	1221203-530	5995-01-387-3817	1
c. Label, cable	SLSH-2015-5	7690-01-049-1770	1
d. Tiewraps	MS3367-2-9	5975-00-156-3253	1
e. Arrester, electrical	COHP-150	5920-01-390-1340	2
Kit D			
f. Codex 3263 modem	1219739-202	5895-01-377-7105	1
g. DTE cable, DB 25/ Micro 25 connector	1222302-307	5995-01-407-2893	1
h. Label, cable	SLSH-2015-5	7690-01-049-1770	1
i. Tiewraps	MS3367-2-9	5975-00-156-3253	1
j. Arrester, electrical	COHP-150	5920-01-390-1340	2

9.   **SOURCE OF MATERIALS**

Kits are requisitioned by the ROC Logistics Section and shipped at no cost to the site.

10.   **SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED**

Not applicable.

11.   **TIME AND PERSONNEL REQUIRED**

Work Phases	Work-hours
Unpacking	0.25
Disassembly	0.0
Installation	3.0
Assembly	0.0
Operational Check	1.25
Total Work-hours	4.50

12.   **DOCUMENTS AFFECTED**

Not applicable.

13.   **VERIFICATION STATEMENT**

This modification was successfully installed at the ROC.

14.   **DISPOSITION OF REMOVED AND REPLACED PARTS/MATERIALS**

Not applicable.

15.   **PROCEDURES**

See ATTACHMENT 1.

16.   FAA DISTRIBUTION

This directive is distributed to selected offices and services within Washington headquarters, the William J. Hughes Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facilities/equipment: NXRAD.

17.   CHANGES TO TABLE OF CONTENTS (FAA)

This chapter will be included in the next revision to the table of contents for FAA Order 6345.1, Electronic Equipment Modification Handbook - Next Generation Weather Radar (NEXRAD).

18.   RECOMMENDATIONS FOR CHANGES (FAA)

Forward any recommendations for changes to this directive through normal channels to the National Airway Systems Engineering Division, AOS-200, Operational Support.

19.   REPORTING INSTRUCTIONS

a. NWS

Report completed modification on WS Form A-26, Engineering Management Reporting System Maintenance Record, according to the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), part 2. Include the following information on the WS Form A-26:

- An Equipment Code of RPG in block 7.
- The appropriate Serial Number in block 8.
- A Mod No. of 51 in block 17a.

See ATTACHMENT 5 for a completed sample of WS Form A-26.

b. DoD

Update the AFTO Form 95 to show TCTO compliance. Report TCTO compliance in accordance with TO 00-20-2, Table 3-10, Rule 9.

c. FAA

Enter this directive number, date, and chapter number on the appropriate FAA Form 6032-1, Airway Facilities Modification Record.

Use the Maintenance Management System (MMS) application Log Equipment Modification (LEM) function to report the completion of this modification. Verify N is in the REP COD field to ensure the log entry will be upward reportable to the national data base for access by AOS. This directive should be entered into the LEM fields as follows:

(1) Order No.: 6345.1

(2) Chapter: 20

(3) Change: 23

d. All Agencies

Complete ATTACHMENT 4, and return the information to the ROC by one of the four methods below:

    (1) Mail Address: Program Branch, Logistics Section
                                     WSR-88D Radar Operations Center
                                     3200 Marshall Ave., Suite 101
                                     Norman, Oklahoma 73072-8028

    (2) Fax Number: (405) 366-6553
                                       ATTN: Logistics Section

    (3) E-mail Address: NEXRAD.Logistics@noaa.gov

    (4) Web Version: http://www.osf.noaa.gov/ssb/logistics/complete/

ATTACHMENT 1

RPG PORT EXPANSION PROCEDURES

Tools Required

ESD Component Handling Kit

Technical Manuals Required

Maintenance Instructions, Radar Product Generation (RPG) Group,
dated July 15, 1998
NWS EHB 6-520
AF TO 31P1-4-108-42
FAA TI 6345.1 V11
NAV EM400-AE-MMM-010/WSR-88D

Special Conditions/Preliminary Setup

1. Access the Internet address (URL) below and download the site-specific Narrowband Circuit Reports and Reconfiguration Control Menu for your site.

http://www.osf.noaa.gov/ssb/queries/comms/index.asp

If unable to download the site-specific Narrowband Circuit Reports and Reconfiguration Control Menu, contact the ROC Hotline to obtain the required information.

NOTES

Reference EHB, 6-520 (AF TO 31P1-4-108-42), paragraph 6-5.2, Special Consideration for Replacement Procedures, and 6-5.2.1, Handling of Electrostatic Sensitive Devices, for special considerations for replacement procedures and handling of Electrostatic Discharge (ESD) sensitive devices.

These procedures are for installing multiple kits involving modems and associated cables. Installation paragraphs pertain to those kits required at each site. Step 2 is to be done at a workbench prior to taking the RPG down for installation of the expansion equipment, keeping equipment downtime to a minimum.

** ESD ** **CAUTION** ** ESD **

All WSR-88D printed circuit cards are ESD sensitive which require special handling. Refer to EHB 6-520 (AF TO 31P1-4-108-42) paragraph 6-5.2.1, Handling of Electrostatic Sensitive Devices.

2. For each modem card, ensure the dip switch on the right-hand side, center of each required modem card, is set to switches 2 and 8 **ON**, and 1 and 3 through 7 **OFF**.

ATTACHMENT 1 (Continued)

RPG PORT EXPANSION PROCEDURES

3. Ensure the RPG is shut down prior to removing any circuit cards using EHB 6-520 (AF TO 31P1-4-108-42), paragraph 6-5.3.1, <u>Data Processor Shutdown Procedure.</u>

4. Install new modems (kit A or kit D).

    a. Remove filler panels from slots receiving new modems. The ejectors do not come out with the filler panels.

    b. Install the modem cards, in the next available open slot, in card nest.

5. Install new VME to modem cables for the new modems installed in step 4. Using the labels supplied in the kit, label the cables at each end near the termination point.

6. Install RJ-45, 8-wire modem to adapter panel (**AUDIO**) cables. Audio cables are included with the modems.

    a. Install modem-to-adapter panel cables. Ensure the ferrite bead end of the cables is installed on the modem end.

    b. Using the labels provided in the kit, mark the audio cables.

7. Install surge protectors on the dedicated demarc punchdown block by snapping onto the demarc blocks and the grounding bar. The surge protectors replace the bridge clips. One surge protector is provided for each pair of wires (1 for TX, 1 for RX).

8. Return system to normal operation using EHB 6-520 (AF TO 31P1-4-108-42), paragraph 6-5.3.2.2, <u>Data Processor Turn-on Procedure</u>.

9. Configure modems using EHB 6-520 (AF TO 31P1-4-108-42) updated modem retrofit settings using paragraph 6.6.4 for dedicated modems, <u>Dedicated Port (Rack-Mounted) 14.4 kbps Modem (Codex 3263) Setup Procedures</u>.

10. Test new modems using modem test procedures in ATTACHMENT 2.

11. Reconfigure the narrowband communication lines added in the RPG Applications software. Use the procedures in ATTACHMENT 3 to make the narrowband communications configuration changes.

ATTACHMENT 2

RPG MODEM TEST PROCEDURES

Technical Manuals Required

        Maintenance Instructions, Radar Product Generation (RPG) Group,
        dated July 15, 1998
        NWS EHB 6-520
        AF TO 31P1-4-108-42
        FAA TI 6345.1 V11
        NAV EM400-AE-MMM-010/WSR-88D

1. The modem(s) should be programmed properly using EHB 6-520 (AF TO 31P1-4-108-42), paragraphs 6.6.2, <u>VME to Concurrent I/O Bus Interface Board (VCI-V) Setup Procedure</u>, and 6.6.4, <u>Dedicated Port (Rack-Mounted) 14.4 kbps Modem (Codex 3263) Setup Procedures</u>.

2. Leased line modem (Codex 3263) check for the RPG under test.

    a. Remove the new modem's surge protectors between the RPG and the outside section of the leased line termination block, 2-RJ2DX.   Note the position of the surge protectors since they will be reconnected in a later step.

        (1)   Select one associated PUP (APUP) modem to use for testing.

        (2)   Ensure the APUP user is aware of the pending and temporary off-line status.

    b. Set the APUP leased line modem to `ORIGINATE`.

        (1)   At the modem front panel press **DOWN** until `MODULATION OPT's` is displayed.

        (2)   Press **ACROSS** until `MODE = _____` is displayed.

        (3)   Press **DOWN** until `ORIGINATE` is displayed.

        (4)   Press **ENTER**.

<div align="center">

NOTE

</div>

        The demarcation box has 50 vertical connections starting at the top with 1 and ending at the bottom with 50. Leased line modem 1 is at the top with TX at terminals 1 and 2 and RX at terminals 3 and 4. Modem 2's TX 5 and 6 and RX at 7 and 8, etc. For RPGs with more than 12 leased line modems, the 13th through 24th modem will be on a second demarcation box.

ATTACHMENT 2 (Continued)

RPG MODEM TEST PROCEDURES

c. Using a set of four jumper wires, connect the TX pair of the APUP modem to the RX pair of the modem under test and the RX pair of the APUP modem to the TX pair of the modem under test. For example, if the modem under test was modem 2 and the APUP modem is 1, the pin assignments would be: pin 1 to pin 7, pin 2 to pin 8, pin 3 to pin 5, and pin 4 to pin 6 at the RPG side of the phone demarcation box.

NOTE

> This test will not work if the transmit level is set to 0 dBm. It may be necessary to set the transmit level lower to -15 dBm to work from modem to modem.

d. Verify both modem front panels (dedicated modems 1 and 2) read `Data 14400` (this takes a few seconds).

e. Leave the jumper wires on pins 1, 2, 3, and 4 (ORIGINATE modem), but move the wire ends connected to pins 5, 6, 7, and 8 four pins down for the next modem under test.

f. Verify both modem front panels read `Data 14400` (this takes a few seconds).

g. Repeat steps 2.e and 2.f until all new leased line modems have been tested.

h. Reset the APUP leased line modem to `ANSWER`.

    (1) At the modem front panel press **DOWN** until `MODULATION OPT's` is displayed.

    (2) Press **ACROSS** until `MODE = ____` is displayed.

    (3) Press **DOWN** until `ANSWER` is displayed.

    (4) Press **ENTER**.

i. Install the surge protectors removed in step 2.a.

j. Return all equipment and the work area to original status.

ATTACHMENT 3

APPLICATION SOFTWARE CHANGES TO EXPANSION PORTS AT THE RPG

NOTES

NWS technicians must make the DoD RPG adaptation data
updates on the DoD Unit Control Position (UCP) located in the
NWS forecast office.

If an RDA/RPG Remote Access Terminal is installed, refer to the
corresponding keystrokes (i.e., <Enter> versus <Return> and
<Alt><Tab> versus <Shift> and <Port> keys). RDA/RPG Remote
Access Terminal keystroke differences will be located in the
conversion chart provided with the RDA/RPG Remote Access
Terminal installation kit. Refer to the conversion chart for all
keystrokes having a <u>double underline</u> for the applicable key strokes
(i.e., <u><Return></u> will convert to <Enter>).

1. Update narrowband application data by performing the following procedures:

   a. Ensure the RPG is operating at the start of these procedures.

   b. Have two blank Small Computer System Interface (SCSI) tapes ready for backing up
       adaptation files.

   c. Use the information contained in the site-specific Narrowband Circuit Report and
       Reconfiguration Menu to correctly update the narrowband application data.

<u>Step</u>	<u>Action/Procedure</u>	<u>Comments</u>
1.	At the Unit Control Position (UCP) terminal (application mode), press function key **<F1>**	Displays the RPG Main menu.
2.	At the UCP main menu, key in **AD,***password1***,NB,***password2***,RE<u><Return></u>**	Allows modification of the narrowband configuration.

NOTE

If the password (*PUP ID/Password*) is typed incorrectly, press the
<u><Shift><Tab></u> keys simultaneously to retype the password; a
backspace will become part of the password.

3.	At the command line, enter **M,***line#***<u><Return></u>**	Repeat as necessary to update all the new narrowband configuration lines.
4.	At the command line, enter **I,***line#***<u><Return></u>**	Use this command only when there are new lines to be added (inserted). Repeat as necessary to include all new lines.

ATTACHMENT 3 (Continued)

APPLICATION SOFTWARE CHANGES TO EXPANSION PORTS AT THE RPG

Step	Action/Procedure	Comments
5.	After all the changes have been made, enter **U,Y<Return>** **E<Return>** then press the function key **<F1>**	Updates and ends the narrowband configuration modification.
6.	At the command line, enter **U,SH,O<Return>**	Shuts down the RPG Application software and allows the narrowband configuration to go into effect.
7.	Press the **<Shift>** and **<Port>** keys simultaneously.	Systems Console mode is displayed.
8.	At the * prompt, enter **RPGUP<Return>**	Starts Application software.
9.	Press the **<Shift>** and **<Port>** keys simultaneously.	Application mode is displayed.
10.	At the UCP main menu, enter **AD,**password1**,NB,**password2**,VI<Return>**	Verifies the narrowband configuration changes are correct. If not correct, repeat steps 1 through 9.
11.	At the UCP terminal, press function key **<F1>**	Displays the RPG Main menu.

NOTE

For disk backup, ensure the write protect is off prior to inserting the blank cartridge tape.

Step	Action/Procedure	Comments
12.	At the SCSI tape unit, insert a blank cartridge tape in the SCSI tape drive and slide the lever.	Ensure tape is secured in the SCSI tape drive. The unit will rewind the tape if necessary.
13.	Press the **<Shift>** and **<Port>** keys simultaneously.	Systems Console is displayed. (If not a collocated RPG/RDA, have the RDA maintenance terminal in the RPG Systems Console mode.)
14.	At the * prompt, enter **BACKFILE<Return>**	Loads the backup utility data files to the SCSI tape. When the transfer is completed END OF TASK Ø is displayed.
15.	Remove the cartridge tape from the SCSI tape unit. Label the date of the backup tape with the site name and the name of the files copied.	Store all the tapes in a safe but accessible location.

ATTACHMENT 3 (Continued)

APPLICATION SOFTWARE CHANGES TO EXPANSION PORTS AT THE RPG

Step	Action/Procedure	Comments
16.	Press the **<Shift>** and **<Port>** keys simultaneously.	Returns the RPG to normal operation.
17.	Notify the WSR-88D Hotline upon completion of modem installation and software adaptation data changes.	

ATTACHMENT 4

RPG MODEM EXPANSION

Site Name: _____

Site Identifier: _____

Total Time to Complete this Modification Document: _____

Technician's Name(s): _____

Technician's Phone Number: _____

Modem Type Installed: _____

Date Completed: _____

Problem(s) Encountered:
_____

_____

_____

_____

Upon completion of this form, return the information to the ROC using one of the four methods below:

      1. Mailing Address: Program Branch, Logistics Section
                                WSR-88D Radar Operations Center
                                3200 Marshall Ave., Suite 101
                                Norman, OK 73072-8028

      2. FAX Number: (405) 366-6553
                                ATTN: Logistics Section

      3. E-mail Address: NEXRAD.Logistics@noaa.gov

      4. Web Version: http://www.osf.noaa.gov/ssb/logistics/complete/

ENGINEERING MANAGEMENT REPORTING SYSTEM
MAINTENANCE RECORD

Document Number: G 50249

General Information

1. Open Date	Time	2. Initials	3. Response Priority (check one)	4. Close Date	Time
09 / 15 / 00	0900	TJS	☐ Immediate ☐ Routine ☐ Low ☒ Not Applicable	09 / 15 / 00	1500

5. Description: INSTALLED NEW MODEM, COMPLETED RPG MODEM TEST, MADE SOFTWARE CHANGES TO EXPANSION PORTS AT RPG

Equipment Information

6. Station ID	7. Equipment Code	8. Serial Number	9. TM	10. AT	11. How Mal.
MLB	RPG	B90-A0007	M	M	999

12. EQUIPMENT OPERATIONAL STATUS TIMES

a. Fully Operational	Partly Operational		Not Operational	
b. Logistics Delay	b. Logistics Delay	c. All Other	d. Logistics Delay	e. All Other
				6:00

13. Parts Failure Information

Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1							
2							
3							
4							
5							

14. Work Load Information

Type	Staff Hrs.
a. Routine	
b. Non-routine	
c. Travel	
d. Misc.	6:00
e. Overtime	

15. Maintenance Comments: EXPANDED NARROWBAND COMM PORTS IN RPG I.A.W. MOD NOTE 51

16. Initials: TJS

Miscellaneous Information

17. SPECIAL PURPOSE REPORTING

a. Mod. No.	b. Mod./Act./Deact. Date	c. Vendor Part Number (New Part)	d. Serial Number (Old Part)	e. Serial Number (New Part)
51	09/15/00	ASN		

18. CONFIGURATION MGMT. REPORTING (use as directed)